DATE	REVISION NUMBER	INITIALS	DESCRIPTION
19th May 2010	245-01994-010	SC	INITIAL REVISION
30th Nov 2010	245-01994-020	SC/JW	Changed formfactor 1. RF TX matching updated. 2. VDD12_BB VDD12_synth, PLL_USB isolated from VDD12_RF 3. Sw Inductor L1 current rating increased to 2.3A 4. 0.01uF cap decoupling on VDD12_INT, VDD33_SWREG 5. Biasref cap C64, Tp6, Tp7 removed 6. Removed attenuators for UART, SPI_MI_SO nets 7. Pull up on SPI_CS_L 10. VREF dividers R70,R77 1K 1% 11. LEDs rearranged per DIR format. 12. GPIOs remapped per alloc plan, I2S MCLK = GPIO14 I2S MICIN= GPIO16 13. R593 No Load, LED_LINK_4 opt connection to GPIO12 and GPIO22 14. Removed R92 15. Cap for CGND 16. RT8010 5V input and inductor rating of L60 =1.6A 17. Ext reg divider R311, R312 to have 1.23V 18. C160,161,171 - no LOAD
8th Dec 2010	245-01994-021	SC/JW	Made 40MHz xtal as No Load
28th Jan 2011	245-01994-022	SC	UART SOUT: Remove R21, load R18 = 0 ohm 1.2V EXT: R151 = No Load Increase Decap: C94,C116,C136,C143 = 22uF
25th Apr 2011	245-01994-030	SC	Changes: 1. Removed C354 2. Added 2nd order LPF, provision for notch on Tx 3. Added C539 4. Changed R162, R164 to 0201 5. Changed C36,C37,C40,C41 to 0201 6. Added R152 7. Changed SW1,SW2 to 167-00001-000
18th Jul 2011	245-01994-031	SC	Changes: 1. Removed C534 (Correcting -030 Rev history) 2. Changed Tx match to improve o/p power R280 - R283 = 1.5nH;C22,C26 = 2.0pF; C15,C17 = 1.8pF;C21 = 2nH; C19 = 1.8nH;C29,C64 = 0 ohm; C113, C31 = NL 3. Changed C356 to 0.1uF

AP123

2X2 802.11 b/g/n 2.4GHz ACCESS POINT
AR9341 BASED 4 LAN + 1 WAN Fast Ethernet
REFERENCE DESIGN

CONTRACT NO.		
DRAWN BY	DATE	Jul 18 2011
ENGINEER		Srikanth
PROJECT ENGINEER		
QUALITY ASSURANCE		
CONFIGURATION		
DESIGN ACTIVITY APPROVAL		
DESIGN APPROVAL		

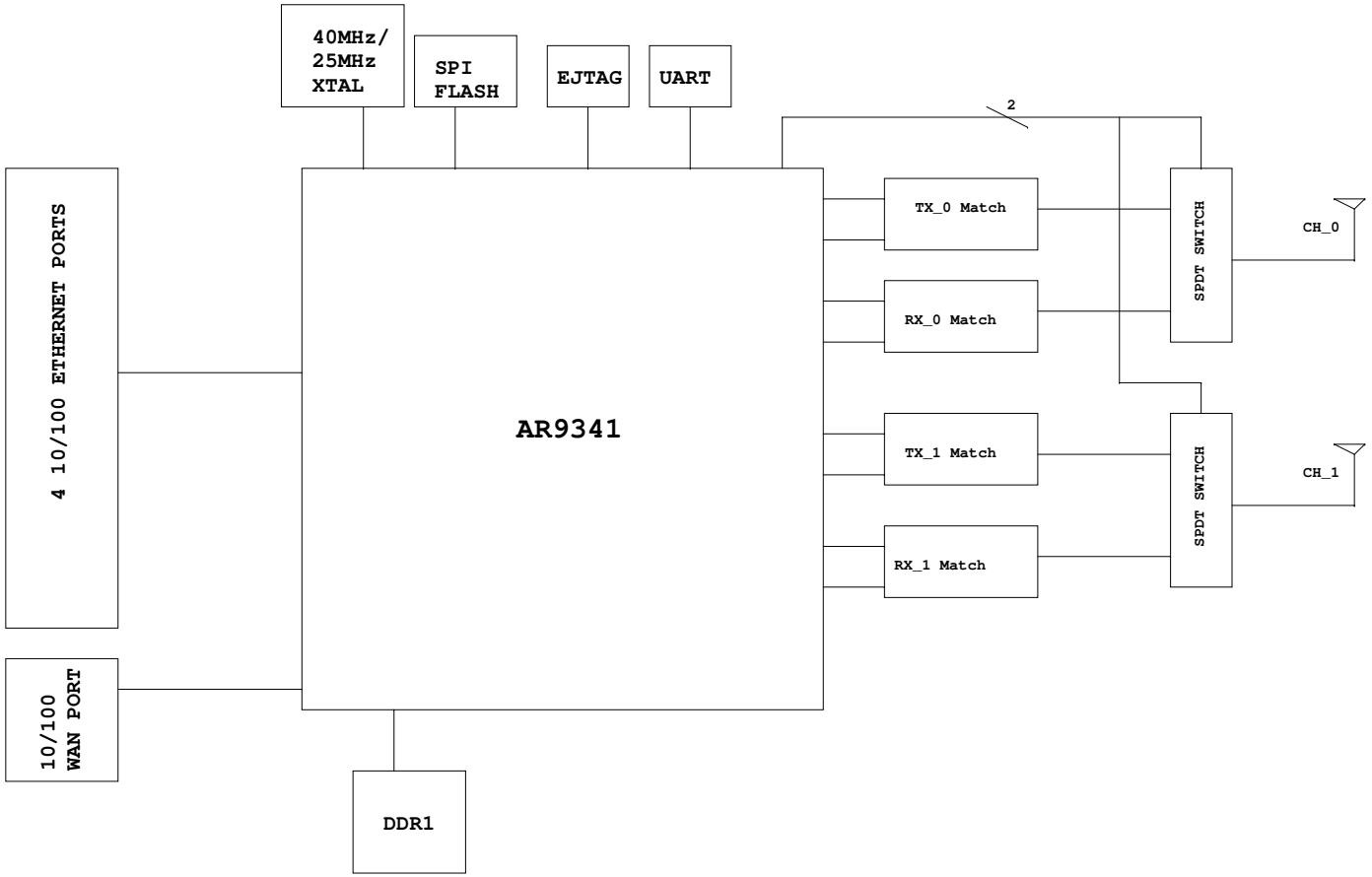
QUALCOMM ATHEROS
1700 TECHNOLOGY DRIVE
SAN JOSE, CA 95110, USA

TITLE

Title Page and Rev History

SIZE	CAGE Code	DWG NO	REV
C	<Cage Code>	245-01994-031	<RevCode>

SCALE	RELEASE DATE	SHEET
NONE	<Date>	1 of 9



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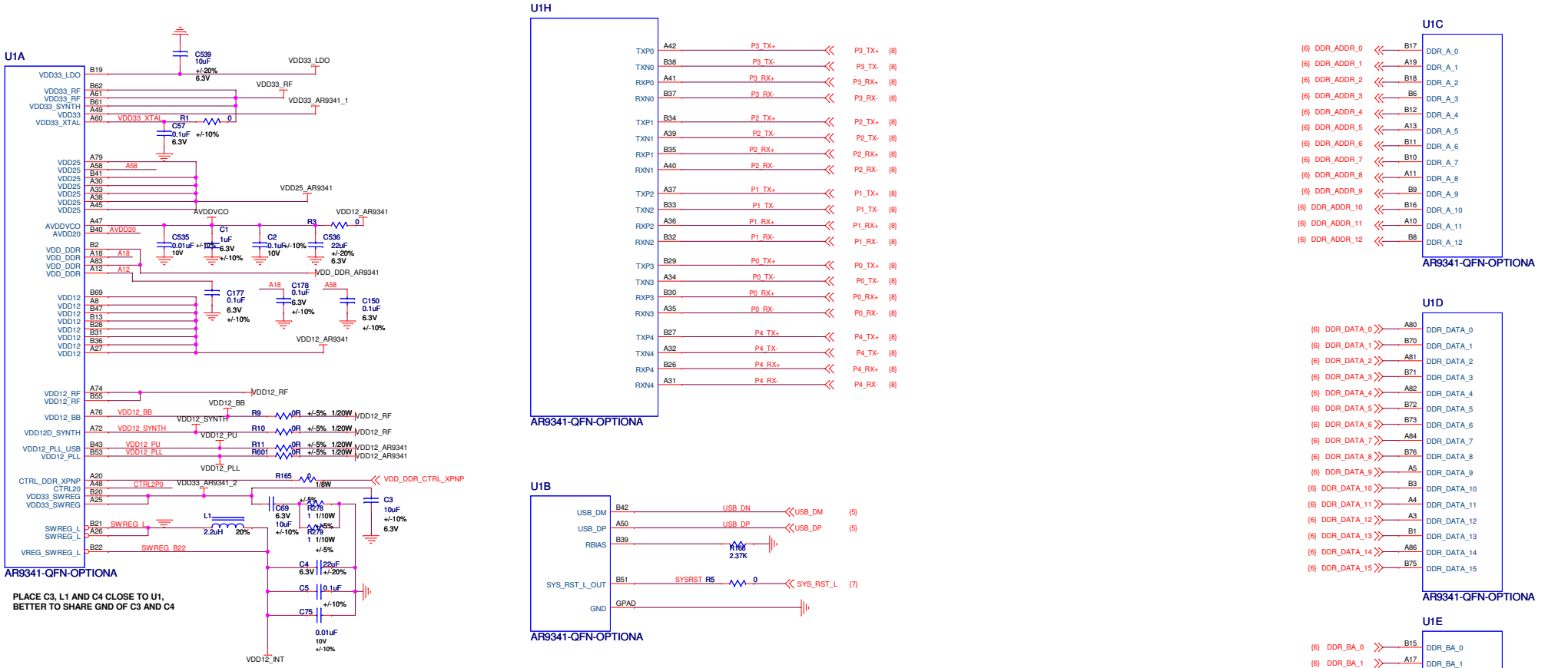
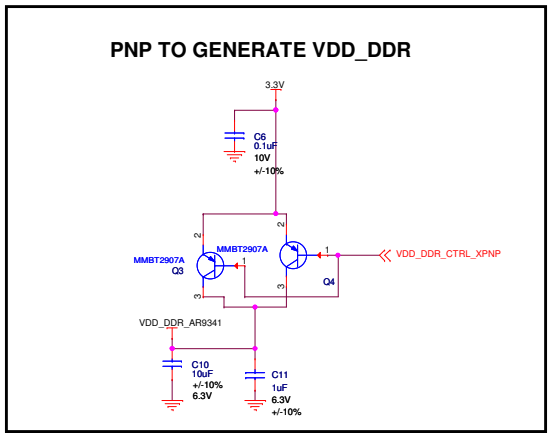
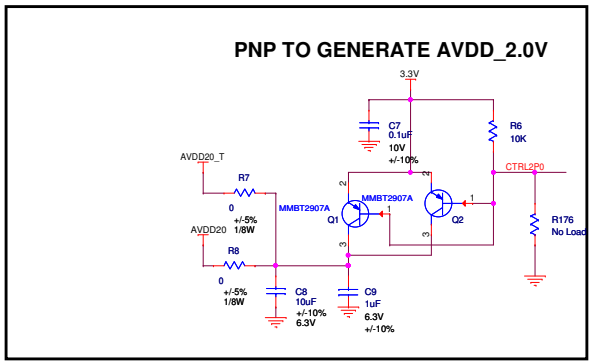
QUALCOMM ATHEROS 1700 TECHNOLOGY DRIVE SAN JOSE, CA 95110				TITLE **Block Diagram**	
DATE: Jul 18 2011	SIZE <SIZE>	REV <RevCode>	SHEET 2 OF 9	DWG NO 245-01994-031	







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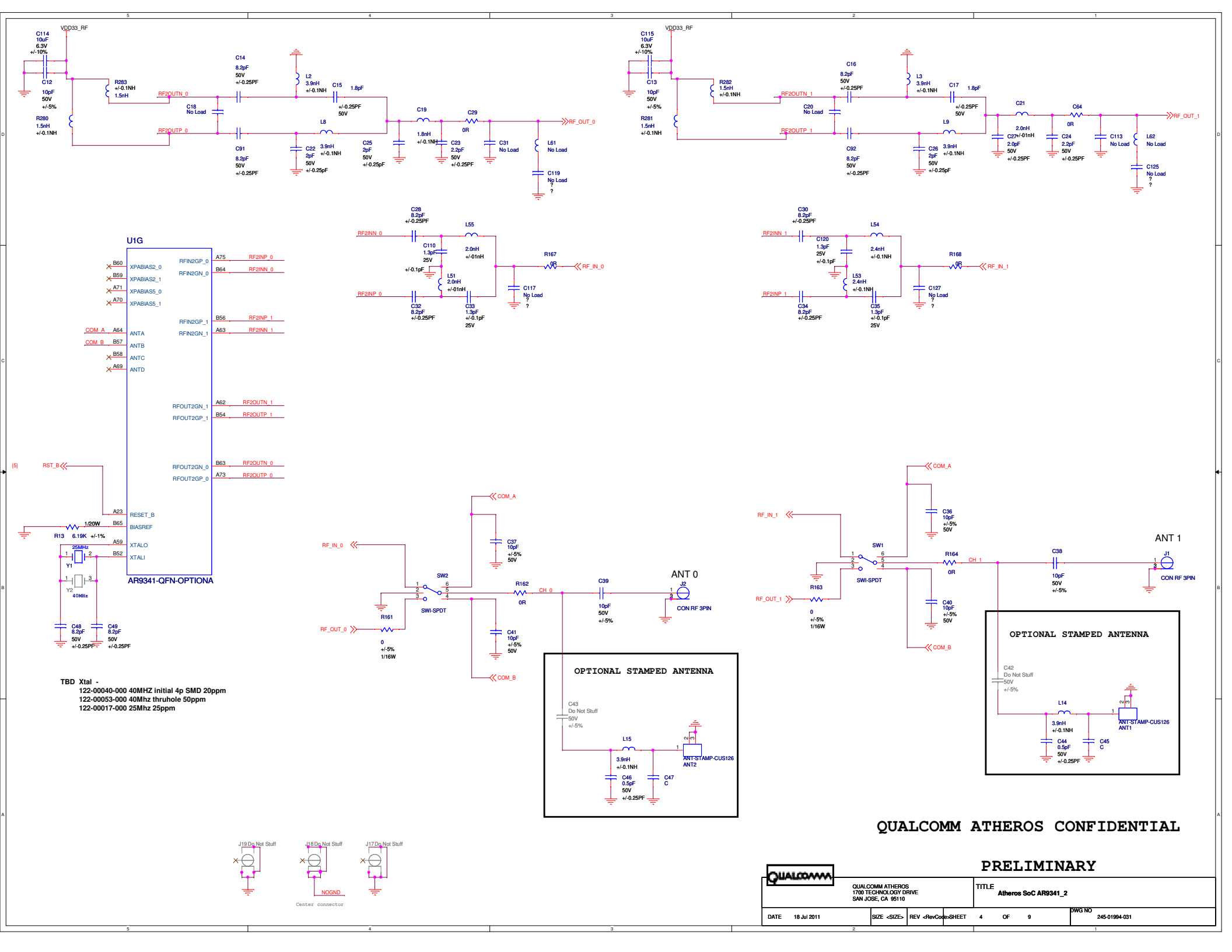
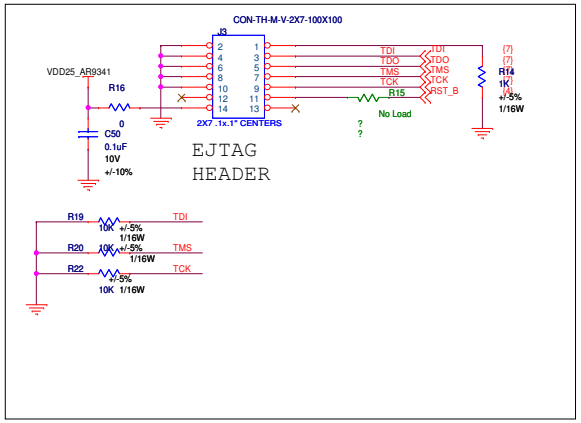
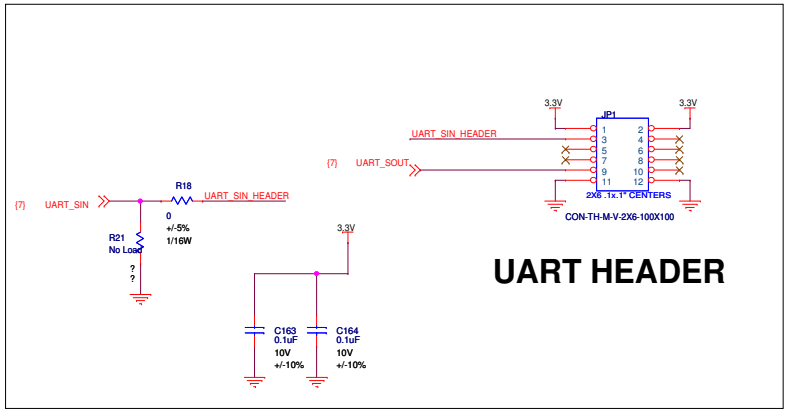
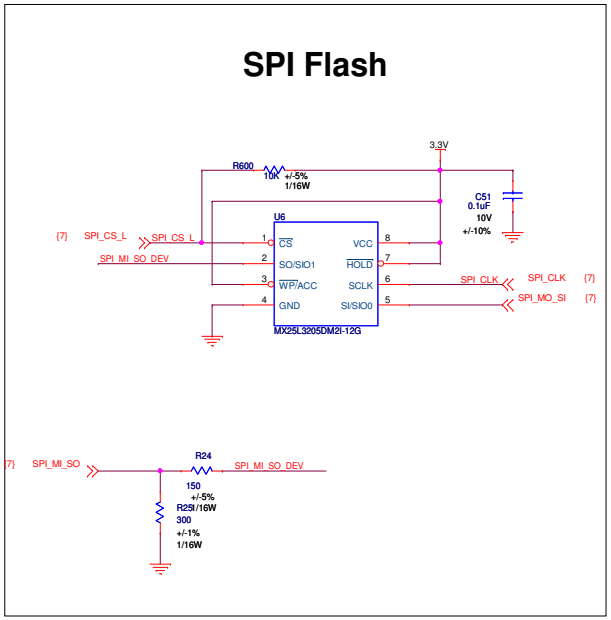
PRELIMINARY

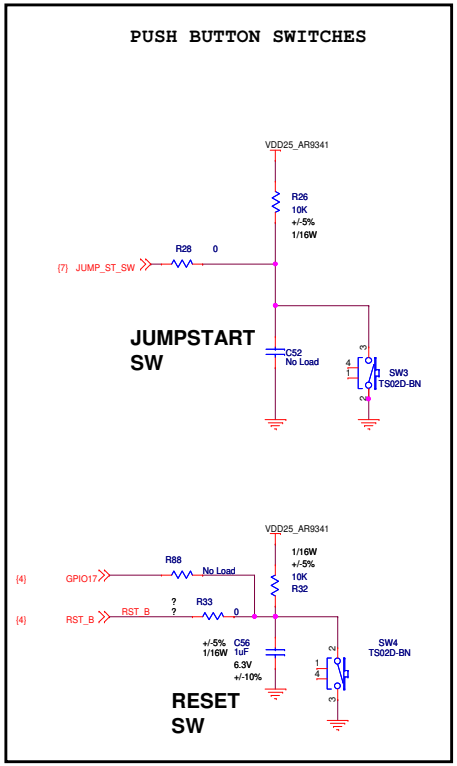
QUALCOMM ATHEROS 1700 TECHNOLOGY DRIVE SAN JOSE, CA 95110					TITLE Atheros_Soc_AR9341_1	
DATE Jul 18 2011	SIZE <SIZE>	REV <RevCode>	SHEET 3	OF 9	DWG NO	245-01994-031

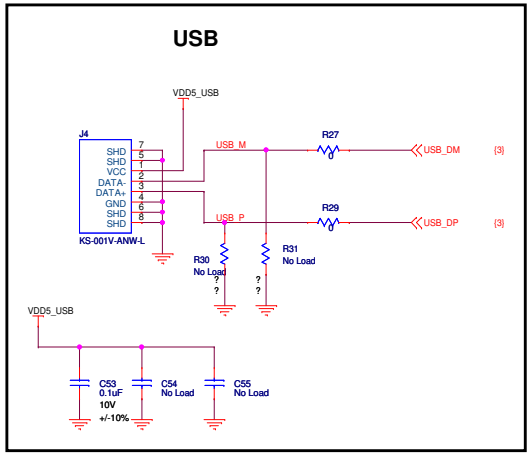

VDD33_RF
C114 10uF 6.3V +/-10%
C12 10pF 50V +/-5%
R280 1.5nH +/-0.1NH
R283 +/-0.1NH 1.5nH
RF2OUTN_0
RF2OUTP_0
C18 No Load
C14 8.2pF 50V +/-0.25PF
C91 8.2pF 50V +/-0.25PF
L2 3.9nH +/-0.1NH
C15 1.8pF +/-0.25PF 50V
L8
C22 2pF 50V +/-0.25pF
3.9nH +/-0.1NH
C25 2pF 50V +/-0.25pF
C19 1.8nH +/-0.1NH
C23 2.2pF 50V +/-0.25PF
C29 0R
C31 No Load
L61 No Load
C119 No Load
RF_OUT_0
VDD33_RF
C115 10uF 6.3V +/-10%
C13 10pF 50V +/-5%
R281 1.5nH +/-0.1NH
R282 1.5nH +/-0.1NH
RF2OUTN_1
RF2OUTP_1
C20 No Load
C16 8.2pF 50V +/-0.25PF
C92 8.2pF 50V +/-0.25PF
L3 3.9nH +/-0.1NH
C17 1.8pF +/-0.25PF 50V
L9
C26 2pF 50V +/-0.25pF
3.9nH +/-0.1NH
C21 2.0nH +/-01nH
C27 2.0pF 50V +/-0.25PF
C64 0R
C24 2.2pF 50V +/-0.25PF
C113 No Load
L62 No Load
C125 No Load
RF_OUT_1
U1G
AR9341-QFN-OPTIONA
B60 XPABIAS2_0
B59 XPABIAS2_1
A71 XPABIAS5_0
A70 XPABIAS5_1
COM_A A64 ANTA
COM_B B57 ANTB
B58 ANTC
A69 ANTD
RFIN2GP_0 A75 RF2INP_0
RFIN2GN_0 B64 RF2INN_0
RFIN2GP_1 B56 RF2INP_1
RFIN2GN_1 A63 RF2INN_1
RFOUT2GN_1 A62 RF2OUTN_1
RFOUT2GP_1 B54 RF2OUTP_1
RFOUT2GN_0 B63 RF2OUTN_0
RFOUT2GP_0 A73 RF2OUTP_0
A23 RESET_B
B65 BIASREF
A59 XTALO
B52 XTALI
{5} RST_B
R13 6.19K +/-1% 1/20W
Y1 25MHz
Y2 40MHz
C48 8.2pF 50V +/-0.25PF
C49 8.2pF 50V +/-0.25PF
RF2INN_0
RF2INP_0
C28 8.2pF +/-0.25PF
C110 1.3pF 25V +/-0.1pF
C32 8.2pF +/-0.25PF
L55 2.0nH +/-01nH
L51 2.0nH +/-01nH
C33 1.3pF +/-0.1pF 25V
R167 0R
C117 No Load
RF_IN_0
RF2INN_1
RF2INP_1
C30 8.2pF +/-0.25PF
C120 1.3pF 25V +/-0.1pF
C34 8.2pF +/-0.25PF
L54 2.4nH +/-0.1NH
L53 2.4nH +/-0.1NH
C35 1.3pF +/-0.1pF 25V
R168 0R
C127 No Load
RF_IN_1
COM_A
RF_IN_0
C37 10pF +/-5% 50V
SW2
SW1-SPDT
R162 0R
CH_0
C39 10pF 50V +/-5%
ANT 0
J2
CON RF 3PIN
R161 0 +/-5% 1/16W
RF_OUT_0
C41 10pF +/-5% 50V
COM_B
OPTIONAL STAMPED ANTENNA
C43 Do Not Stuff 50V +/-5%
L15 3.9nH +/-0.1NH
C46 0.5pF 50V +/-0.25PF
C47 C
ANT-STAMP-CUS126 ANT2
COM_A
RF_IN_1
C36 10pF +/-5% 50V
SW1
SW1-SPDT
R164 0R
CH_1
C38 10pF 50V +/-5%
ANT 1
J1
CON RF 3PIN
R163 0 +/-5% 1/16W
RF_OUT_1
C40 10pF +/-5% 50V
COM_B
OPTIONAL STAMPED ANTENNA
C42 Do Not Stuff 50V +/-5%
L14 3.9nH +/-0.1NH
C44 0.5pF 50V +/-0.25PF
C45 C
ANT-STAMP-CUS126 ANT1
TBD Xtal -
122-00040-000 40MHZ initial 4p SMD 20ppm
122-00053-000 40Mhz thruhole 50ppm
122-00017-000 25Mhz 25ppm
J19 Do Not Stuff
J18 Do Not Stuff
J17 Do Not Stuff
NOGND
Center connector
QUALCOMM ATHEROS CONFIDENTIAL
PRELIMINARY
QUALCOMM ATHEROS
1700 TECHNOLOGY DRIVE
SAN JOSE, CA 95110
TITLE
Atheros SoC AR9341_2
DATE 18 Jul 2011
SIZE <SIZE>
REV <RevCode>
SHEET 4 OF 9
DWG NO 245-01994-031

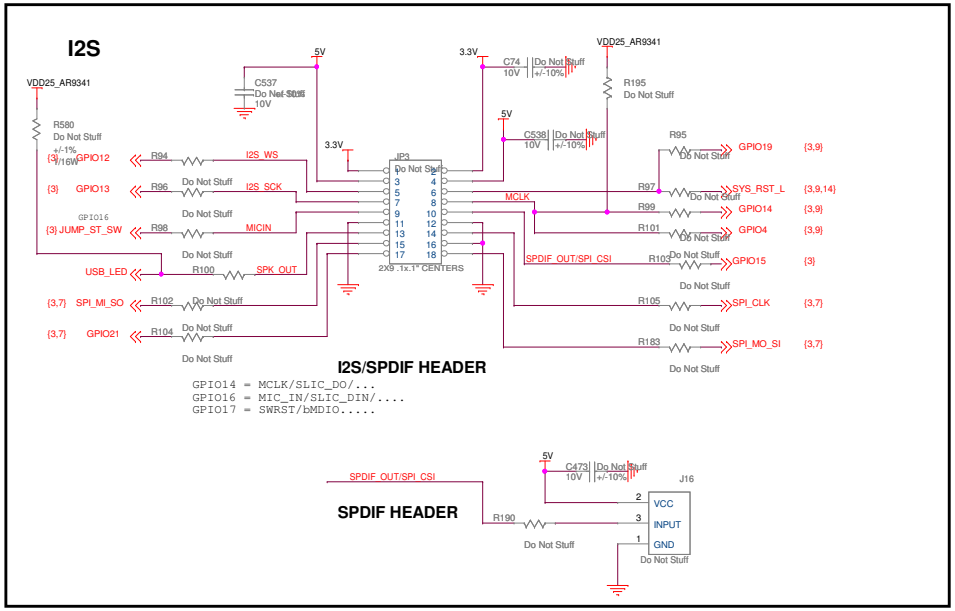












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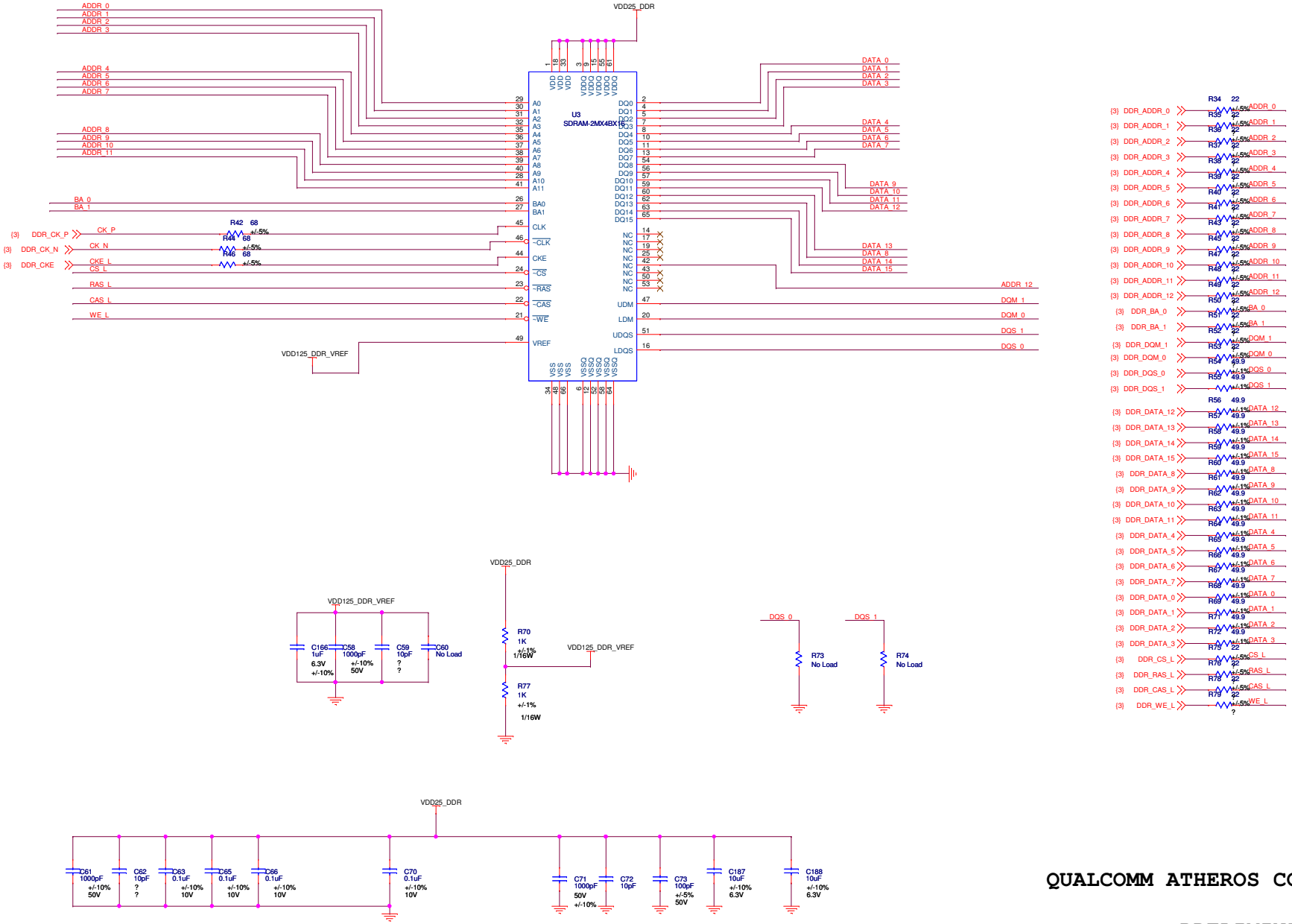
ATHEROS CONFIDENTIAL
PRELIMINARY

PRELIMINARY

QUALCOMM ATHEROS 1700 TECHNOLOGY DRIVE SAN JOSE, CA 95110			TITLE UART EJTAG USB I2S	
DATE 18 Jul 2011	SIZE <SIZE>	REV <RevCode>	SHEET 5 OF 9	DWG NO 245-01994-031

DDR



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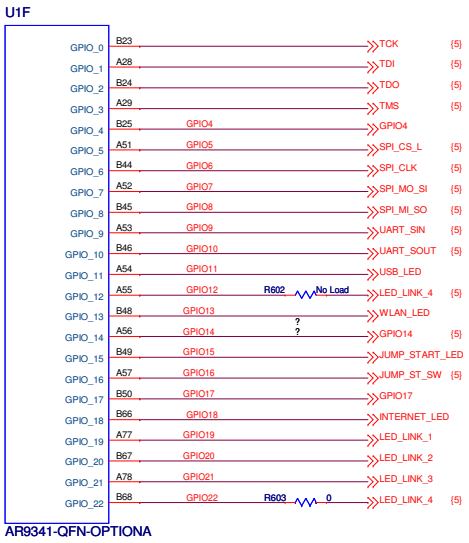
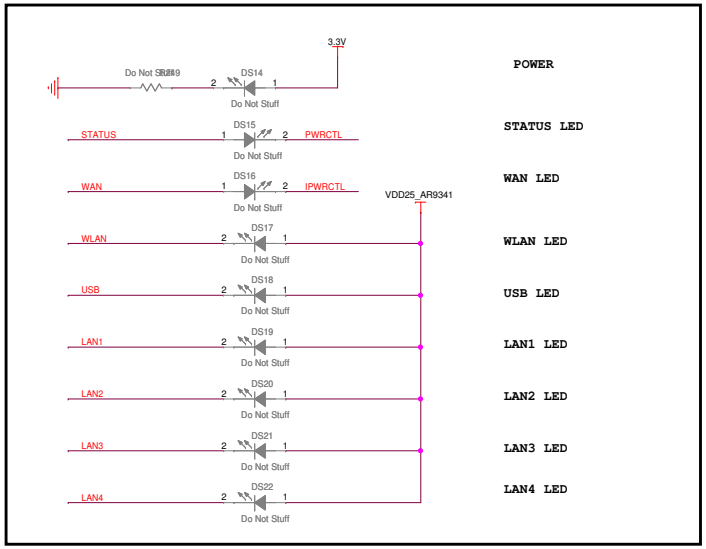
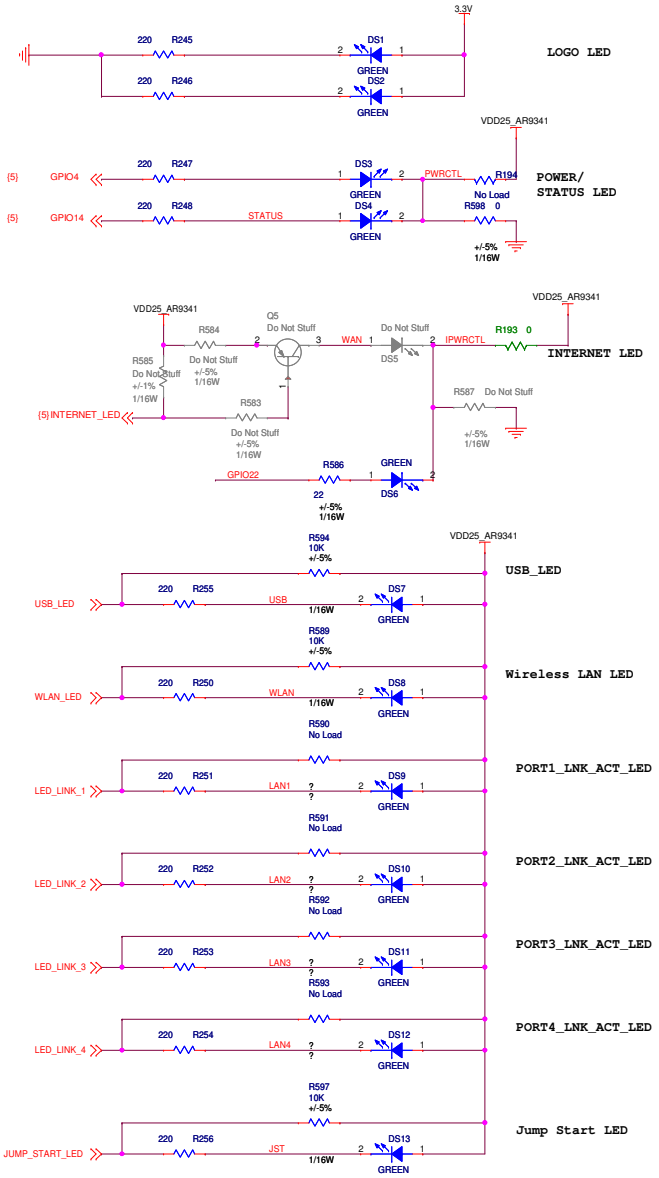
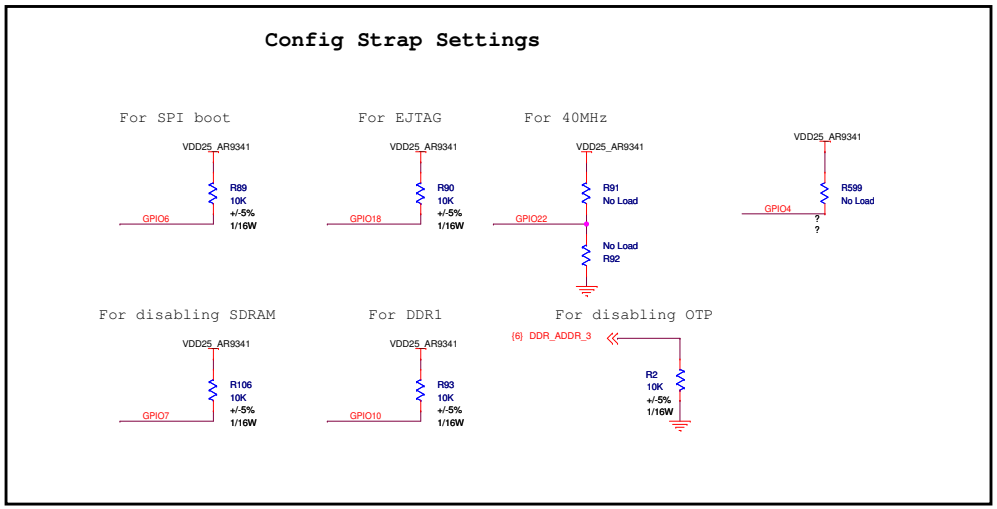
PRELIMINARY

QUALCOMM ATHEROS 1700 TECHNOLOGY DRIVE SAN JOSE, CA 95110				TITLE DDR1	
DATE 18 Jul 2011	SIZE <SIZE>	REV <RevCode>	SHEET 6 OF 9		DWG NO 245-01994-031









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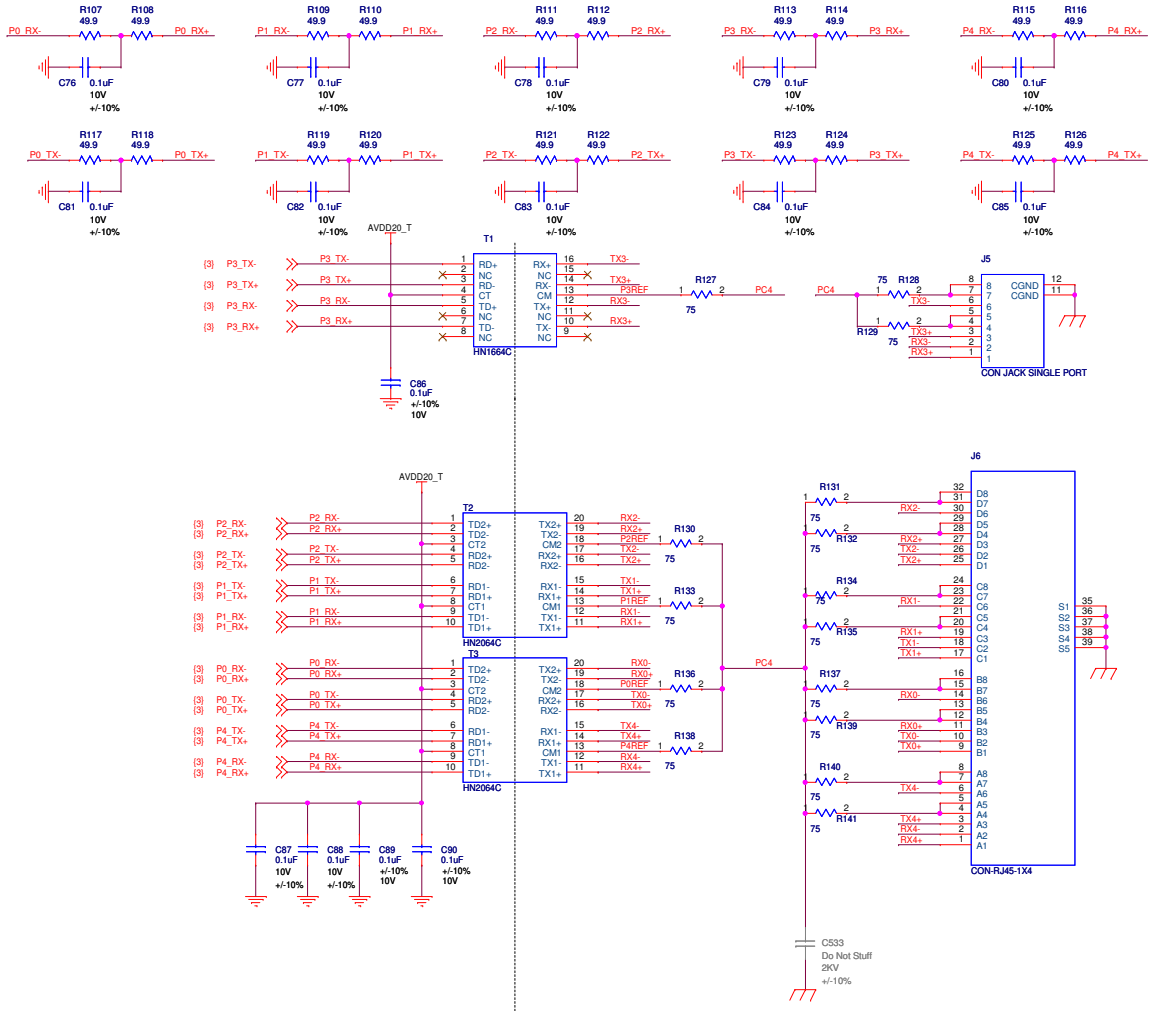
QUALCOMM ATHEROS
1700 TECHNOLOGY DRIVE
SAN JOSE, CA 95110

TITLE: Boostraps & LEDs

DATE	SIZE	REV	SHEET	OF	DWG NO
18 Jul 2011	<SIZE>	<RevCode>	7	9	245-01994-031



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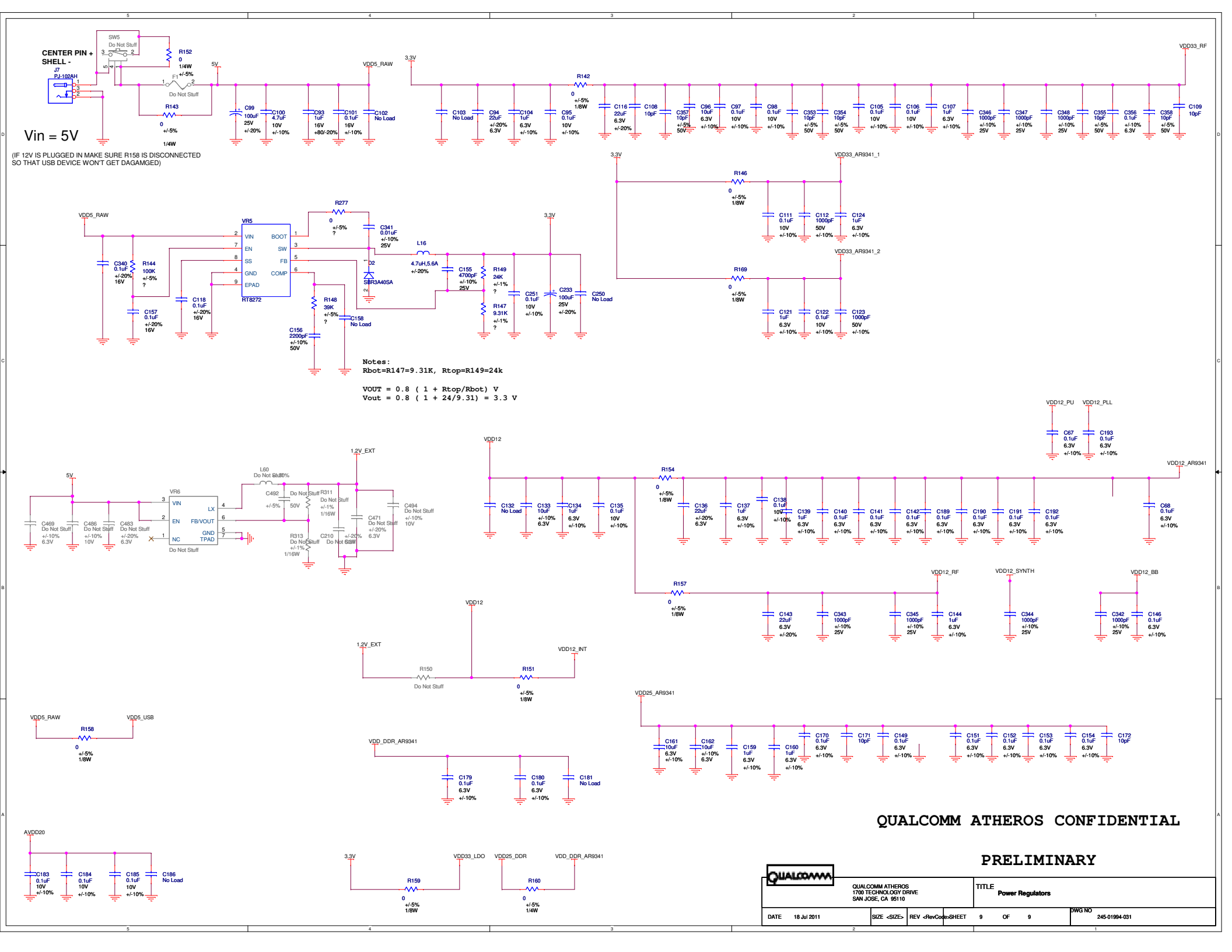
PRELIMINARY

QUALCOMM ATHEROS 1700 TECHNOLOGY DRIVE SAN JOSE, CA 95110			TITLE Ethernet Magnetics	
DATE 18 Jul 2011	SIZE <SIZE>	REV <RevCode>	SHEET 8 OF 9	DWG NO 245-01994-031


CENTER PIN +
SHELL -
J7
PJ-102AH
SW5
Do Not Stuff
R152
0
1/4W
+/-5%
F1
Do Not Stuff
R143
0
+/-5%
1/4W
5V
VDD5_RAW
Vin = 5V
(IF 12V IS PLUGGED IN MAKE SURE R158 IS DISCONNECTED
SO THAT USB DEVICE WON'T GET DAGAMGED)
C99 100uF 25V +/-20%
C100 4.7uF 10V +/-10%
C93 1uF 16V +80/-20%
C101 0.1uF 16V +/-10%
C102 No Load
3.3V
R142
0
+/-5%
1/8W
C103 No Load
C94 22uF +/-20% 6.3V
C104 1uF 6.3V +/-10%
C95 0.1uF 10V +/-10%
C116 22uF 6.3V +/-20%
C108 10pF
C357 10pF +/-5% 50V
C96 10uF 6.3V +/-10%
C97 0.1uF 10V +/-10%
C98 0.1uF 10V +/-10%
C353 10pF +/-5% 50V
C354 10pF +/-5% 50V
C105 0.1uF 10V +/-10%
C106 0.1uF 10V +/-10%
C107 1uF 6.3V +/-10%
C346 1000pF +/-10% 25V
C347 1000pF +/-10% 25V
C348 1000pF +/-10% 25V
C355 10pF +/-5% 50V
C356 0.1uF +/-10% 6.3V
C358 10pF +/-5% 50V
C109 10pF
VDD33_RF
3.3V
R146
0
+/-5%
1/8W
VDD33_AR9341_1
C111 0.1uF 10V +/-10%
C112 1000pF 50V +/-10%
C124 1uF 6.3V +/-10%
R169
0
+/-5%
1/8W
VDD33_AR9341_2
C121 1uF 6.3V +/-10%
C122 0.1uF 10V +/-10%
C123 1000pF 50V +/-10%
VDD5_RAW
VR5
VIN
EN
SS
GND
EPAD
BOOT
SW
FB
COMP
RT8272
R277
0
+/-5%
?
C341 0.01uF +/-10% 25V
L16
4.7uH,5.6A
+/-20%
D2
SBR3A40SA
C155 4700pF +/-10% 25V
R149 24K +/-1% ?
R147 9.31K +/-1% ?
C251 0.1uF 10V +/-10%
C233 100uF 25V +/-20%
C250 No Load
C340 0.1uF +/-20% 16V
R144 100K +/-5% ?
C157 0.1uF +/-20% 16V
C118 0.1uF +/-20% 16V
R148 39K +/-5% ?
C158 No Load
C156 2200pF +/-10% 50V
Notes:
Rbot=R147=9.31K, Rtop=R149=24k
VOUT = 0.8 (1 + Rtop/Rbot) V
Vout = 0.8 (1 + 24/9.31) = 3.3 V
VDD12_PU
VDD12_PLL
C67 0.1uF 6.3V +/-10%
C193 0.1uF 6.3V +/-10%
VDD12
VDD12_AR9341
R154
0
+/-5%
1/8W
C132 No Load
C133 10uF 6.3V +/-10%
C134 1uF 6.3V +/-10%
C135 0.1uF 10V +/-10%
C136 22uF +/-20% 6.3V
C137 1uF 6.3V +/-10%
C138 0.1uF 10V +/-10%
C139 1uF 6.3V +/-10%
C140 0.1uF 6.3V +/-10%
C141 0.1uF 6.3V +/-10%
C142 0.1uF 6.3V +/-10%
C189 0.1uF 6.3V +/-10%
C190 0.1uF 6.3V +/-10%
C191 0.1uF 6.3V +/-10%
C192 0.1uF 6.3V +/-10%
C68 0.1uF 6.3V +/-10%
1.2V_EXT
5V
VR6
VIN
EN
NC
LX
FB/VOUT
GND
TPAD
Do Not Stuff
L60
Do Not Stuff
C492
Do Not Stuff
+/-5%
50V
R311
Do Not Stuff
+/-1%
1/16W
R313
Do Not Stuff
+/-1%
1/16W
C210
Do Not Stuff
+/-20%
6.3V
C471
Do Not Stuff
+/-20%
6.3V
C494
Do Not Stuff
+/-10%
10V
C469
Do Not Stuff
+/-10%
6.3V
C486
Do Not Stuff
+/-10%
10V
C483
Do Not Stuff
+/-20%
6.3V
R157
0
+/-5%
1/8W
VDD12_RF
VDD12_SYNTH
VDD12_BB
C143 22uF 6.3V +/-20%
C343 1000pF +/-10% 25V
C345 1000pF +/-10% 25V
C144 1uF 6.3V +/-10%
C344 1000pF +/-10% 25V
C342 1000pF +/-10% 25V
C146 0.1uF 6.3V +/-10%
VDD12
1.2V_EXT
R150
Do Not Stuff
R151
0
+/-5%
1/8W
VDD12_INT
VDD5_RAW
R158
0
+/-5%
1/8W
VDD5_USB
VDD25_AR9341
C161 10uF 6.3V +/-10%
C162 10uF +/-10% 6.3V
C159 1uF 6.3V +/-10%
C160 1uF 6.3V +/-10%
C170 0.1uF 6.3V +/-10%
C171 10pF
C149 0.1uF 6.3V +/-10%
C151 0.1uF 6.3V +/-10%
C152 0.1uF 6.3V +/-10%
C153 0.1uF 6.3V +/-10%
C154 0.1uF 6.3V +/-10%
C172 10pF
VDD_DDR_AR9341
C179 0.1uF 6.3V +/-10%
C180 0.1uF 6.3V +/-10%
C181 No Load
AVDD20
C183 0.1uF 10V +/-10%
C184 0.1uF 10V +/-10%
C185 0.1uF 10V +/-10%
C186 No Load
3.3V
VDD33_LDO
VDD25_DDR
VDD_DDR_AR9341
R159
0
+/-5%
1/8W
R160
0
+/-5%
1/4W
QUALCOMM ATHEROS CONFIDENTIAL
PRELIMINARY
QUALCOMM ATHEROS
1700 TECHNOLOGY DRIVE
SAN JOSE, CA 95110
TITLE
Power Regulators
DATE 18 Jul 2011
SIZE <SIZE>
REV <RevCode>
SHEET 9 OF 9
DWG NO
245-01994-031